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NetWorker[®]

Release 6.0.1-x
HP OpenVMS Version

Release Supplement

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Preface

Read the information contained in this Release Supplement before installing the LEGATO NetWorker[®] software on your OpenVMS Alpha[™] or I64 operating system.

About This Release Supplement

This Release Supplement briefly describes new features, known limitations, configuration tips, and workarounds for this release of the NetWorker software. For a complete list of documentation related to this product, see "Related Documents" on page 8.

Late-breaking information obtained following the release of the CD-ROM is included in an electronic version of this document that is available in the Support section of the LEGATO web site (www.legato.com). Refer to the web site periodically to view the latest release of this document.

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Related Documents

The following documents, available on the LEGATO web site at *www.legato.com*, provide further information about this release of the NetWorker software for OpenVMS Alpha:

- *LEGATO NetWorker Fixed Bugs List, Release 6.0.1-x, HP OpenVMS Alpha Version*
- *LEGATO NetWorker Installation Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*
- *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*
- *LEGATO Command Reference Guide, Release 6.0.1*
- Technical Bulletins

Revision History of this Document

The *LEGATO NetWorker Release Supplement, Release 6.0.1-x, HP OpenVMS Alpha Version*, was originally published on February 5, 2004.

Chapter 1: NetWorker Software Release 6.0.1-D

This Release Supplement describes the new and enhanced features of the NetWorker release 6.0.1-D software for use on the OpenVMS operating system. NetWorker is supported on OpenVMS Alpha and I64 operating systems. This chapter describes this release in general and any thing special for topics:

- "Operating System Requirements" on page 9
- "New or Enhanced Features" on page 10
- "Installation and Update Notes" on page 15
- "Known Limitations" on page 19

"OpenVMS I64 Supplement" on page 25 describes topics that are particular to OpenVMS on I64.

Operating System Requirements

NetWorker release 6.0.1-D requires OpenVMS Alpha Version 7.0 at a minimum. However, be aware that some of the new features of this release of NetWorker are not supported by OpenVMS versions prior to Version 7.2.

As described in "New or Enhanced Features" on page 10, NetWorker now supports several features related to extended file specifications. These were introduced in OpenVMS Version 7.2. A major component of extended file specifications is the new ODS-5 volume structure, which allows applications to store and display long filenames containing both lowercase and uppercase characters. Filesystem operations remained case insensitive until the release of OpenVMS Version 7.3-1, which added the abilities to distinguish between matching filenames with differing case and to control whether processes ignore or honor the case sensitivity of filenames.



Important: Depending on which version of OpenVMS you are using, some or all of the NetWorker features associated with extended file specifications and the ODS-5 volume structure may be unavailable to you. Refer to

New or Enhanced Features

This section describes the following new or enhanced features (listed alphabetically by title), which are included in NetWorker release 6.0.1-D:

- "Daemon Log File No Longer Created" on page 10
- "Directory Structure Has Changed" on page 10
- "Extended File Specifications Now Supported" on page 11
- "nsrinfo Command Displays Filenames as Stored (New -r Option)" on page 13
- "Save Behavior Has Changed - New Directive: norecord" on page 13
- "Oracle and Oracle Rdb Database Backup and Recovery Support Added" on page 14

New or enhanced features that are directly related to the NetWorker installation are described in "Installation and Update Notes" on page 15.

Daemon Log File No Longer Created

This release of NetWorker software for OpenVMS Alpha no longer creates the log file *daemon.log*. The **nsrexecd** daemon writes all entries to *nsrexecd.log*.

Directory Structure Has Changed

To support the new arbitrary installation destination (described further in "Installation Destination Can be Specified By User" on page 15), the directory structure created by NetWorker has changed with release 6.0.1-D. Previously, the NetWorker software was installed on the system disk and used the following directory trees:

```
SYS$COMMON: [NSR]
SYS$COMMON: [NSR.LOGS]
SYS$COMMON: [NSR.RES]
.
.
.
SYS$SPECIFIC: [NSR]
SYS$SPECIFIC: [NSR.LOGS]
SYS$SPECIFIC: [NSR.RES]
```

You could use the system logical names SYS\$COMMON, SYS\$SPECIFIC, and SYS\$SYSROOT when accessing files in the NetWorker directory tree.

To support alternate directory installations, NetWorker release 6.0.1-D uses a new directory level called *NSR\$COMMON* as a prefix for the old (*/NSR*) directory structure, which otherwise remains unchanged. For example:

```
NSR$COMMON: [NSR]
NSR$COMMON: [NSR.LOGS]
NSR$COMMON: [NSR.RES]
.
.
.
```

NetWorker release 6.0.1-D defines its own root directories (*NSR\$node*) based on the name of the node on which it is running. The cluster root directories (*[SYS0.]*, *[SYS1.]*, and so on) are no longer used.

Because the system logical names SYS\$COMMON, SYS\$SPECIFIC, and SYS\$SYSROOT can no longer be used as a reliable method of specifying the location of the NetWorker directory tree, three new logical names are defined by the startup procedure in this release of NetWorker:

```
NSR$COMMON
NSR$SPECIFIC
NSR$SYSROOT
```

These new logical names can be used in place of the aforementioned system logical names to identify the current location of the NetWorker directories, regardless of the destination specified for the installation. The logical names defined in previous releases of NetWorker that provided shortcuts to the NetWorker directories continue to function as they did before. These include the following:

```
NSR$BITMAPS
NSR$LOGS
NSR$RES
NSR$SYSTEM
NSR$TMP
```

Extended File Specifications Now Supported

OpenVMS Alpha Version 7.2 introduced a new feature called *extended file specifications*. This feature, which was enhanced in OpenVMS Version 7.3-1, includes the following:

- A new, optional volume structure called On-Disk Structure Level 5 (ODS-5), which extends the features of the existing ODS-2 disk structure adding support for longer filenames and a wider range of legal characters for use within filenames
- Filename case preservation and recognition
- Support for deeper directory structures

These new features and enhancements allow the OpenVMS operating system to store, manage, serve, and access files with names that are more traditionally used in a Microsoft Windows operating system environment.

To create a process environment where commands are examined using the ODS-5 file specification syntax, you must set the DCL parse style to "extended" using the following command:

```
$ SET PROCESS /PARSE_STYLE=EXTENDED
```

The default parse style is **TRADITIONAL**.

The sections that follow provide more detail on these new OpenVMS features and explain how this release of NetWorker supports them. For more information on extended file specifications, ODS-5 volume structure, and case-sensitive filesystem operations, refer to the following OpenVMS documentation:

- *OpenVMS Alpha Version 7.3-1 New Features and Documentation Overview*
- *OpenVMS User's Manual* (for OpenVMS Alpha Version 7.3-1)

- *OpenVMS Guide to Extended File Specifications* (for OpenVMS Alpha Version 7.2)

These documents are accessible from the following web site (as of the date of publication of this manual):

http://h71000.www7.hp.com/doc/os731_index.html

Note: While some of the features described here were released with OpenVMS Version 7.2, some enhancements to these features were not added until OpenVMS Version 7.3-1. For the most part, the information in this section assumes the use of OpenVMS Version 7.3-1. To determine which features and/or enhancements are available only in Version 7.2, refer to the OpenVMS documentation.

About Longer Filenames and Additional Character Sets

On ODS-5 volumes, filenames (excluding the version number) can be up to 236 8-bit characters or 118 16-bit characters in length. Filenames on ODS-5 volumes can also contain characters from the 8-bit ISO-LATIN1 and 16-bit Unicode (UCS-2) character sets, in addition to the ODS-2 compliant character set.

Filenames on ODS-2 volumes continue to use traditional filename syntax, where filename length is limited to the 39.39 format and valid filename characters are restricted to the ODS-2-compliant character set: A-Z, a-z, 0-9, \$, _, and - (dollar sign, underscore, and hyphen).

Note: Because some ODS-5 file names can use characters not found in the ODS-2 character set, these filenames may be changed when you restore ODS-5 files to an ODS-2 volume. This is necessary to permit creation of these files on the ODS-2 device. Additionally, file attributes specific to ODS-5 and not available on ODS-2 will not be restored.

About Case Sensitivity

Traditionally, the OpenVMS operating system has stored all filenames in all uppercase and ignored filename case during filesystem operations. The introduction of extended file specifications in OpenVMS Version 7.2 enabled applications to store and display file specifications in mixed case on ODS-5 volumes. (Note that ODS-2 continues to support uppercase characters only.)

Until the release of OpenVMS Version 7.3-1, filesystem operations remained case insensitive. OpenVMS Version 7.3-1 enhanced the case sensitivity features on ODS-5 volumes to enable applications and system tools to distinguish among filename specifications that differ in case only.

You can set the DCL process to ignore or recognize case sensitivity with the following command:

```
$ SET PROCESS /CASE_LOOKUP={BLIND|SENSITIVE}
/PARSE_STYLE=EXTENDED
```

The default case lookup type is **BLIND**.

Note: When issuing commands in a case-sensitive process environment, be aware that only those filenames matching the specified name *and case* are returned.

About Deeper Directory Structures

Both ODS-2 and ODS-5 volume structures now support the creation and access of up to 255 directory levels. On ODS-5 volumes, the directory names can be up to 236 8-bit or 118 16-bit characters in length. (Directory names on ODS-2 volumes are still limited to 39 characters.)

How NetWorker Implements/Supports These New Features

This release of NetWorker supports the new OpenVMS features related to extended file specifications and the ODS-5 volume structure as follows:

- When backing up or recovering files on an ODS-5 volume, NetWorker honors both parse style and case sensitivity process settings.
- When backing up or recovering files on an ODS-2 volume, NetWorker ignores both settings.

nsrinfo Command Displays Filenames as Stored (New -r Option)

The **nsrinfo** command has a new option (**-r**) that allows you to view filenames as they are actually stored in the NetWorker index. (This is the default behavior of the **nsrinfo** command on other, non-OpenVMS platforms.)

The NetWorker client for OpenVMS stores filenames in all uppercase in the NetWorker file index. This is done to help support the various case sensitivity options available on OpenVMS. However, by default, the **nsrinfo** command displays filenames on OpenVMS as they would appear if the files were restored (in mixed case, for example). If you include the **-r** option in your **nsrinfo** command line, all filenames are shown as stored (that is, in all uppercase).

The following sample command displays all filenames for a specific client as they are stored in the NetWorker file index:

```
$ mcr nsr$system:nsrinfo -r -s <server> <client>
```

where *<server>* is the name of the NetWorker server being queried and *<client>* identifies the NetWorker client computer whose file index is being queried.

Save Behavior Has Changed - New Directive: norecord

In previous versions of NetWorker, the **save** program did not record the backup time on files it saved unless the **record** directive was specified. In V6.0.1-D and newer, the **save** program records the backup time in the file header unless the **norecord** directive is specified. This represents a change in the default behavior of **save**.

It is no longer necessary to specify the **record** directive when saving files. However, if you do not want **save** to record the backup time on files it saves, you should specify the **norecord** directive.

The default behavior was changed to prevent a problem whereby files that have been recovered are not backed up during the next incremental save operation. The new behavior uses the backup time stamp to avoid this situation.

If you install this version of NetWorker and perform an incremental save, the **save** program will save all files that do not have backup timestamps associated with them. If you have not used the **record** directive for past saves, the **save** program will save

more files than is strictly necessary. After this initial occurrence, incremental saves will behave normally. You can override this behavior by defining the logical name **NSR\$IGNORE_BACKUP_TIME** to any value. In this case, **save** will not consider the backup timestamp when selecting candidates for incremental backup.

For more information about the **record** and **norecord** directives, refer to the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*

Oracle and Oracle Rdb Database Backup and Recovery Support Added

This release of NetWorker software for OpenVMS Alpha includes support for backup and recovery of Oracle and Oracle Rdb databases. The following modules are included in the NetWorker release 6.0.1-D kit:

- NetWorker Module for Oracle
- NetWorker Module for Oracle Rdb

They are listed as separate installation options by the NetWorker PCSI installation procedure. You may install one, both, or neither of these options during a NetWorker client installation. Both options support the use of the **PRODUCT RECONFIGURE** command, which permits the addition of these modules to existing NetWorker client systems at a later date if desired.

These database modules are described further in the sections that follow. For more details, refer to related appendixes in the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*.

About the NetWorker Module for Oracle Rdb

The NetWorker module for Oracle Rdb allows you to back up your online Oracle Rdb databases using NetWorker in tandem with the Oracle Media Management API (SBT interface) and RMU, the Oracle Rdb management utility. Both client-initiated and server-initiated backups are supported

During installation, the NetWorker module for Rdb supplies the following shareable image, which Rdb uses to activate the NetWorker library:

`NSR$SYSTEM:LIBNWRDB_SHR.EXE`

The NetWorker installation also provides a command procedure template called `NSR$RDB_BACKUP_TEMPLATE.COM` that can be customized for use during server-initiated backups. You can create your own scripts if desired. Refer to the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version* for more details.

The NetWorker module on Alpha for Oracle Rdb requires a minimum version of Oracle Rdb with the appropriate patch set as follows:

- Oracle Rdb Release 7.1.2.1.0 (AMV), ID:5029367, Patchset::3261866
- Oracle Rdb Release 7.1.2.1.1 (AMV Performance Kit), ID:5029333, Patchset::3261862
- Oracle Rdb Release 7.2.0.0.1

These Rdb releases are available for downloading from the Oracle Technology Network (OTN) web site at:

<http://otn.oracle.com/software/products/rdb7/index.html>

About the NetWorker Module for Oracle

The NetWorker module for Oracle allows you to back up your online Oracle databases using NetWorker in tandem with the Oracle Media Management API (SBT interface) and Oracle's Recovery Manager (RMAN). Oracle 9i or newer is required for use with this NetWorker module.

During installation, the NetWorker module for Oracle creates the following library, and shareable image which you must link with your Oracle server after installation:

```
NSR$SYSTEM:LIBNWORA64.OLB  
NSR$SYSTEM:LIBNWORA_SHR.EXE
```

Like the module for Oracle Rdb, the NetWorker module for Oracle also provides a command procedure template that can be customized for use during server-initiated backups. Instructions for customizing the template and relinking the library can be found in the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*.

Installation and Update Notes

This section contains release notes related to NetWorker software installations. The following sections are included:

- "Installation Destination Can be Specified By User" on page 15
- "Installation Options Have Changed" on page 17
- "NSR\$EXECD Account Issues Corrected" on page 17
- "Old Directories Remain After Installation" on page 17
- "Extracting the PCSI File on an ODS-5 Volume" on page 18
- "Creating Node-Specific Root Directories" on page 18

For more detailed information on installing this release of NetWorker, refer to the *LEGATO NetWorker Installation Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*.

Installation Destination Can be Specified By User

Previous versions of NetWorker software for OpenVMS Alpha did not support the use of the **/DESTINATION** qualifier with the **PRODUCT INSTALL** command. NetWorker was installed on the system disk by default.

That restriction has been lifted in this release of NetWorker. You can now specify any destination for the NetWorker installation provided you are installing on a system that does not have a previous version of NetWorker. Otherwise, the existing installation location is used and a new destination is not allowed.

The syntax for this new qualifier is as follows:

```
/DESTINATION=device-name:[directory-name]
```

To support this new feature, the old directory structure used by NetWorker has changed and new logical names have been introduced to accommodate the new directory structure. See "Directory Structure Has Changed" on page 10 for more details.

For more information on using the **/DESTINATION** qualifier with the **PRODUCT INSTALL** command, refer to DCL help on the **PRODUCT INSTALL** command.

Installation Options Have Changed

The installation procedure for NetWorker release 6.0.1-D has additional installation options for the new Oracle and Oracle Rdb modules. See "Oracle and Oracle Rdb Database Backup and Recovery Support Added" on page 14 for more information. These options appear when you indicate that you do not accept the default options. For example:

```
Do you want the defaults for all options? [YES] N
Add Storage Node Capability [YES]
Add Oracle/Rdb Database Backup Capability [NO]
Add Oracle Database Backup Capability [NO]
```

You can elect to install any combination of these options. (The storage node option is installed by default, as was the case with previous versions of NetWorker for OpenVMS Alpha.)

You can also add any of the three optional components to an existing client using the **PRODUCT RECONFIGURE** command as described in the *LEGATO NetWorker Installation Guide, Release 6.0.1-D, HP OpenVMS Alpha Version*.

NSR\$EXECD Account Issues Corrected

If you installed earlier versions of the NetWorker software for OpenVMS Alpha, you may recall that the NSR\$EXECD account created by the installation procedure had a blank account name and insufficient privileges for pre- and post-processing activities. Those problems have been corrected in this release of NetWorker.

The installation procedure for release 6.0.1-D of NetWorker correctly assigns an account name of "NetWorkr" (which fits within the allotted space of eight characters). The privileges assigned to the NetWorkr account now include the IMPERSONATE privilege (required to create a fully detached process for post-processing) and the PRMMBX privilege (required by the preprocessing function, which uses a set of permanent mailboxes for communication with the NSR\$EXECD).

Old Directories Remain After Installation

When you install NetWorker release 6.0.1-D on an existing NetWorker client system, old directories remain on the system after the update. The PCSI utility does not remove directories containing files that were not supplied by the original installation (customer-created files and files created or updated by the NetWorker software such as log files). In particular, it does not remove the root directories, *[SYS0.NSR...]*, because they contain files such as *nsrexecd.log* and *servers.;*.

You may want to remove these obsolete directories and their contents after updating to NetWorker release 6.0.1-D. Refer to *LEGATO NetWorker Installation Guide, Release 6.0.1-D, HP OpenVMS Alpha Version* for more information on cleaning up obsolete directories.

Extracting the PCSI File on an ODS-5 Volume

If you extract the PCSI to an ODS-5 volume, you must rename the PCSI file after extracting it from the self-extracting archive file. The OpenVMS **PRODUCT** utility is not able to find a lowercase PCSI filename. When you extract the PCSI file from the self-extracting archive the PCSI filename will be in lowercase. You must rename the lowercase filename to uppercase. For example:

```
lgto-axpvms-snc1nt-v0600-1d-1.pcsi must be renamed to
LGTO-AXPVMS-SNCLNT-V0600-1D-1.PCSI.
```

Creating Node-Specific Root Directories

The procedure for creating node-specific root directories in the installation guide shows the wrong location of the `NSR$CONFIGURE_NODE.COM` file. ECO11 installed `NSR$CONFIGURE_NODE.COM` in `SYS$STARTUP`. The following is the correct procedure:

To complete the installation of the NetWorker software in a cluster environment, you must create system-specific root directories for the NetWorker directory tree. (The **PRODUCT INSTALL** command does this only for the node on which you install the software.)

The NetWorker software distribution provides a command procedure that creates the necessary directories for you on each node. This command procedure is named `NSR$CONFIGURE_NODE.COM` and resides in `SYS$STARTUP`.

The `NSR$CONFIGURE_NODE.COM` command procedure accepts one of the following arguments:

- "ADD"—Adds the root directories for the NetWorker directory tree
- "REMOVE"—Removes the root directories for the NetWorker directory tree

If no argument is specified, a default value of "ADD" is used.

To use the `NSR$CONFIGURE_NODE.COM` command procedure to add NetWorker root directories to each node in a cluster, do the following:

1. Log onto the node you want to configure.
2. Execute the command procedure as follows:

```
$ @SYS$STARTUP:NSR$CONFIGURE_NODE "ADD"
```

This command adds the necessary root directories to the current node. Repeat this procedure for each node in the cluster.

Note: As an alternative to logging on to each node you want to configure, you can use the **SYSMAN** utility to execute the command ON selected set of nodes.

For example:

```
$ MCR SYSMAN
SET ENVIRONMENT/NODE=(TOWN,CITY)
SET PROFILE/PRIV=(BYPASS)
DO @SYS$STARTUP:NSR$CONFIGURE_NODE "ADD"
EXIT
```

See the *OpenVMS System Manager's Manual* for additional information on using the **SYSMAN** utility.

To use the *NSR\$CONFIGURE_NODE.COM* command procedure to remove node-specific root directories, use the following command:

```
$ @SYS$STARTUP:NSR$CONFIGURE_NODE "REMOVE"
```

Known Limitations

This section describes problems or restrictions that are known to exist in this release of the NetWorker software for OpenVMS Alpha. The following limitations (arranged alphabetically by title) are described:

- "nsrexecd ACCVIO on Multiprocessor Clients During Concurrent Saves" on page 19
- "Oracle and/or Oracle Rdb Limitations" on page 19
- "Save Fails With RPC Error When Using TCPware" on page 21
- "Directories That Do Not Have the Directory Bit Set" on page 22
- "Files That Have the Directory Bit Set" on page 22
- "Directories that have no Name" on page 22
- "ODS-5 Volume Restrictions" on page 22
- "Size Of A File Device Saveset" on page 24

nsrexecd ACCVIO on Multiprocessor Clients During Concurrent Saves

Under certain circumstances, the **nsrexecd** client daemon fails with an ACCVIO during backup of OpenVMS Alpha clients. This situation occurs on OpenVMS Alpha client computers with multiple CPUs when the Parallelism attribute on the NetWorker server is set to a value greater than 8 and multiple, concurrent saves are occurring. Significantly increasing the page file quota on the OpenVMS Alpha client has no impact.

Oracle and/or Oracle Rdb Limitations

The following sections describe known limitations or problems with the NetWorker modules for Oracle and/or Oracle Rdb:

- "Parallel Recover Operations Not Supported (Oracle Rdb Module)" on page 19
- "Parallel Backup Operation Restricted (Oracle Rdb Module)" on page 20
- "RMU Tracing Feature Not Supported (Oracle Rdb Module)" on page 20
- "RMU/LIBRARY/LIST Does Not Support Wildcards (Oracle Rdb Module)" on page 20
- "RMU/RECOVER/LIBRARY Fails When Specified Save Set Does Not Exist (Oracle Rdb Module)" on page 21
- "Problem With Rdb V7.2 Using A Plan (Oracle Rdb Module)" on page 21

Parallel Recover Operations Not Supported (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support parallel recover operations.

Parallel Backup Operation Restricted (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support both types of Rdb parallel backups. There are two types of parallel backups. One type is a parallel backup using threads. Rdb uses threads to do the backup when you use more than one writer in the `/LIBRARIAN=(WRITER=` qualifier. The following shows an example of the unsupported parallel backup using three writers:

```
$ RMU/BACKUP/LIBRARIAN=(WRITER=3) DISK$ORACLE[RDB72DB] MFP
```

However, the following command is supported:

```
$ RMU/BACKUP/LIBRARIAN=(WRITER=1) DISK$ORACLE[RDB72DB] MFP
```

The other type of parallel backup is initiated using the `RMU/PLAN` qualifier. NetWorker does support this type of parallel backup. However there is a problem with RMU that restricts the number of parallel processes to 4 or less.

RMU Tracing Feature Not Supported (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support the use of the **TRACE** and **LEVEL** switches in an `RMU/LIBRARIAN` command. For example:

```
RMU/LIBRARIAN=(TRACE=filespec, LEVEL=level)
```

To cause the NetWorker software to write debug and trace messages to a specified file, you must define the following NetWorker logical names before beginning the database backup:

- NSR_DEBUG_FILE
- NSR_DEBUG_LEVEL

It is recommended that you deassign these logical names after the backup operation completes. Refer to the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version* for more information.

RMU/LIBRARY/LIST Does Not Support Wildcards (Oracle Rdb Module)

The RMU program supports a function that queries the librarian catalog. In the case of NetWorker, this function queries the media and file indexes. The format for the RMU list command is:

```
RMU/LIBRARY/LIST <save-set-name>
```

In general, RMU appends the string `.RBF` to any name supplied by the NetWorker Rdb backup template file. Thus, if you use the template file, the resulting save set names are of the form: `<BACKUP_NAME><DATE-TIME>.RBF`, where `<BACKUP_NAME>` is the string assigned to the `BACKUP_NAME` symbol within the backup procedure, and `<DATE-TIME>` is the date and time of the backup. The **RMU/LIBRARY/LIST** command works correctly only when the fully specified save set name is provided as shown in the following example:

```
$ rmu/library/list corporate_data_2003-10-30_091311.RBF
```

```
LIBRARIAN BACKUP FILES
```

```
BACKUP NAME: CORPORATE_DATA_2003-10-30_091311.RBF
```

```
CREATION METHOD: stream
```

```
CREATION DATE/TIME: Thu Oct 30 09:13:23 2003
```

```

EXPIRATION DATE/TIME:  Fri Oct 29 10:14:34 2004
VOLUME LABEL:          wumpus.tz87.008
SHARING MODE:          single user
ORDERING MODE:         sequential access

```

RMU/RECOVER/LIBRARY Fails When Specified Save Set Does Not Exist (Oracle Rdb Module)

RMU generates a bugcheck if you specify a save set name that does not exist.

Problem With Rdb V7.2 Using A Plan (Oracle Rdb Module)

There is a problem with Rdb V7.2 when using a plan file. You will get an ACCVIO when you try to use a plan file. The following shows an example of the ACCVIO:

```

$ RMU/BACKUP/PLAN backup.plan
%SYSTEM-F-ACCVIO, access violation, reason mask=04, virtual
address=000000007FFA4F38, PC=0000000000706014, PS=00000000
%RMU-F-FATALOSI, Fatal error from the Operating System
Interface.
%RMU-I-BUGCHKDMP, generating bugcheck dump file
SYS$SYSDEVICE: [ORACLE_RDB]RMUBUGCHK.DMP;
%RMU-F-FTL_BCK, Fatal error for BACKUP operation at 23-FEB-2006
17:23:59.68

```

Save Fails With RPC Error When Using TCPware

The TCPware TCP/IP software for OpenVMS supports a maximum write size of 65440 bytes, which is lower than the default write size of the NetWorker **save** program. Therefore, if you are using TCPware TCP/IP software and attempting to save large files that exceed TCPware's maximum write size limitation, the **save** program may fail with the following error:

```
RPC error -- unable to send
```

If this problem occurs, define the logical name NSR\$MAX_WRITESZ in NetWorker's startup command procedure (*SYS\$STARTUP:NSR\$STARTUP.COM*) to a value that is equal to or less than the TCPware size limit. The recommended value for the NSR\$MAX_WRITESZ logical is 65024 bytes. (Note that the value assigned to this logical name should be a multiple of 512 bytes.)

The NetWorker startup command procedure already contains the following, commented-out definition:

```
$!  define/system/executive nsr$max_writesz 65024
```

To define the NSR\$MAX_WRITESZ logical name, simply remove the comment character (the exclamation point (!)) from this definition and re-execute the *SYS\$STARTUP:NSR\$STARTUP.COM* command procedure.

Directories That Do Not Have the Directory Bit Set

Directories that do not have the directory bit set are saved as a regular file. In order for a file to be directory, it must meet two conditions: have a ".DIR;1" type and version and the directory bit must be set. If either of these two conditions are not met NetWorker saves the file as a regular file. NetWorker does not save any files that might be in the directory. You reset the directory bit by use the SET FILE/NODIRECTORY command.

In the NWRECOVER and NWARDHIVE GUI, a file with the directory bit reset is displayed as a regular file. However, the ".DIR;1" is not displayed even though it is displayed as a regular file.

Files That Have the Directory Bit Set

Files that have the directory bit set are saved and can be recovered. However, NetWorker issues a warning: "size grew during save". The file did not grow and is recovered exactly as it was saved. The warning is there because of the logic that calculates the size of the file thinks it is a directory and it is not.

A variation of a file with a directory bit set is a directory that has a version other than ";1". For example: FRED.DIR;2. The file system does not recognize this as a directory. NetWorker treats it as a file with the directory bit set. You can create this file by editing a directory.

Directories that have no Name

Directories that have no name are saved as a regular file by NetWorker, but cannot be recovered. A directory that has no name would be displayed as ".DIR;1" when doing a directory of a directory.

ODS-5 Volume Restrictions

There are certain restrictions with ODS-5 volumes. Different versions of OpenVMS may behave differently. Also, how you have the process parse_style and case_lookup affects what files will be saved and which ones will be recovered. You may want to reevaluate whether you want or need an ODS-5 volume.



Important: All of the restriction listed below have the process parse_style set to extended. If you have the process parse_style set to traditional, you cannot ever access files that are not all upper case characters.

The following sections describes these restrictions:

- "Directories That Do Not Have a Type of ".DIR;1"" on page 23
- "Directories With the Same Name But Different Case" on page 23

Directories That Do Not Have a Type of “.DIR;1”

Directories that do not have a type of “.DIR;1” are not supported by NetWorker or by the file system. For example: all_lower_case.dir;1 is NOT supported. However, all_lower_case.DIR;1 is supported. For ease of explanation in this section I will call any directory with type of “.dir;1” or any permutation of dir as an invalid directory. You can create an invalid directory that has a type other than “.DIR;1” by using the RENAME or SET FILE/ENTRY OpenVMS utilities. You can check to see if any of your directories have been renamed using some variation of the following command:

```
$ pipe directory disk$i64v821:[000000...]*.*;* | -
_$ search sys$input ".dir;1",".Dir;1",".dIr;1"/exact
```

Even though the file system does not support invalid directories, NetWorker saves these invalid directories and contents. However, there are certain restrictions that you must follow:

- By default when you schedule a group save from the server, you will save any invalid directories and their contents.
- If you do a NSRSAVE or NSRARCHIVE command from the DCL prompt, you must have your process case_lookup set to blind to backup invalid directories.
- If you are using NWBACKUP or NWARCHIVE, you must start them from a process that case_lookup is set to blind to save invalid directories.

Even though the file system does not support invalid directories, NetWorker can recover invalid directories and their contents. The recovered directory will have a “.DIR;1” type which is supported by NetWorker and the file system.

Directories With the Same Name But Different Case

Having directories with the same name but different case will not be recovered correctly unless you have your process setting for case_lookup set to sensitive. Setting your process case_lookup to sensitive pertains to: NSRRECOVER, NSRRETRIEVE, NWRECOVER, and NWRETRIEVE. This is not a restriction of NetWorker, but of the file system. For example: you have Mixed_Case.DIR;1 and mIXED_cASE.DIR;1 in the same directory. If the case_lookup is set to blind, on a recover the first directory is created and when it tries to create the second one, the recover will receive a directory already exists from the file system. To restore these directories, you must have the process case_lookup set to sensitive.



Important: Do not create two directories with the same name but with “.dir;1” and “.DIR;1” types. For example: DISK\$TMP:[TEST]fred.dir;1 and DISK\$TMP:[TEST]fred.DIR;1. When you do the following command your process will loop:

```
$ set process/case_lookup=blind
$ directory DISK$TMP:[TEST...] *.*;*
```

Size Of A File Device Saveset

There is a limit to the size of a file device saveset if you are going to recover an individual file from the saveset. The following table show the saveset size limit for versions of OpenVMS.

Table 1. Size of File Device Saveset

OpenVMS Version	Size of Saveset Limit
Below V7.3	2.1 Gigabytes
V7.3 and above	9.2 Exabytes

The above limites are only for recovering an individual file in a saveset on a file device. If you recover the complete saveset these limits do not apply.

Chapter 2: OpenVMS I64 Supplement

This release of NetWorker supports the OpenVMS I64 operating system. There are very few differences between NetWorker for OpenVMS Alpha and I64. This chapter describes the differences for the OpenVMS I64 operating system. The following topics are included in this chapter:

- "Operating System Requirements" on page 25
- "Installation" on page 25
- "Installation In A Mixed Cluster" on page 25
- "Recovering an OpenVMS V8.2 System Disk" on page 26
- "Known Limitations" on page 26

Operating System Requirements

NetWorker release 6.0.1-D requires OpenVMS I64 Version 8.2 as a minimum.

Installation

The installation of NetWorker on the OpenVMS I64 operating system is the same as installing it on OpenVMS Alpha except that the filenames of the self-extracting archive and PCSI file are different. The self-extracting archive filename is: *LGTO-I64VMS-SNCLNT-V0600-1D-1.EXE*. The PCSI filename is *LGTO-I64VMS-SNCLNT-V0600-1D-1.PCSI*.

Installation In A Mixed Cluster

When installing NetWorker in a mixed cluster of OpenVMS Alpha and OpenVMS I64 operating systems, you must install the appropriate kit on the appropriate operating system. Also, you cannot have a common NSR\$SYSTEM. If you install NetWorker on the system disk, there should be no problem because you must have a separate system disk for each architecture. If you specify the destination with the `/DESTINATION` qualifier when installing the SNCLNT, be sure to specify a different destination for each architecture. See the installation manual on installation using the `/DESTINATION` qualifier.

Recovering an OpenVMS V8.2 System Disk

When recovering an OpenVMS V8.2 system disk, you must initialize the boot block on the target disk after recovering the data. On previous OpenVMS versions you used SYS\$SYSTEM:WRITEBOOT.EXE to write the boot block after a recover. On OpenVMS I64 you must use the SET BOOTBLOCK command. Use the procedure for recovering a system disk in the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version* and then use the SET BOOTBLOCK command instead of RUN SYS\$SYSTEM:WRITEBOOT.EXE. For example:

```
$ set bootblock dka100:
```

Known Limitations

This section describes problems or restrictions that are known to exist in this release of the NetWorker software for OpenVMS I64. The following limitations (arranged alphabetically by title) are described:

- "Oracle Module Limitations" on page 26
- "Oracle Rdb Module Limitations" on page 26

Oracle Module Limitations

Oracle has not been released for the OpenVMS I64 operating system at the time of this release. Therefore the Oracle module is not supported with this release. To allow it to be installed at a later date when it has been tested, the Oracle module option has been left in the installation script. However, if you install the option, you will get the following error when you try to execute RMAN scripts.

If you install the Oracle option and run an RMAN script, you will get the following error:

```
RMAN-00571: =====
RMAN-00569: ===== ERROR MESSAGE STACK FOLLOWS =====
RMAN-00571: =====
RMAN-03009: failure of allocate command on t1 channel at
12/12/2005 09:35:06
ORA-19554: error allocating device, device type: SBT_TAPE, device
name:
ORA-27000: skgfgsbi: failed to initialize storage subsystem (SBT)
layer
%SYSTEM-?-NOMSG, Message number 00001BC6
ORA-19511: Error received from media manager layer, error text:
SBT error = 7110, errno = 0, sbtinit: internal error - invalid
argument(s)
```

Oracle Rdb Module Limitations

Oracle Rdb module is enabled with the latest ECO. If you did not install the Oracle Rdb Data Protection Module during the initial installation, you must reinstall *LGTO-I64VMS-SNCLNT-V0600-1D-1.PCSI* and select the appropriate options along

with the Oracle Rdb Data Protection Module. Once you install the Oracle Rdb Data Protection Module, you can install the latest ECO and enable RMU backups and recovers

The following sections describe known limitations or problems with the NetWorker modules for Oracle and/or Oracle Rdb:

- "Parallel Recover Operations Not Supported (Oracle Rdb Module)" on page 27
- "Parallel Backup Operation Restricted (Oracle Rdb Module)" on page 27
- "RMU Tracing Feature Not Supported (Oracle Rdb Module)" on page 27
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Parallel Recover Operations Not Supported (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support parallel recover operations.

Parallel Backup Operation Restricted (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support both types of Rdb parallel backups. There are two types of parallel backups. One type is a parallel backup using threads. Rdb uses threads to do the backup when you use more than one writer in the /LIBRARIAN=(WRITER= qualifier. The following shows an example of the unsupported parallel backup using three writers:

```
$ RMU/BACKUP/LIBRARIAN=(WRITER=3) DISK$ORACLE[RDB72DB] MFP
```

However, the following command is supported:

```
$ RMU/BACKUP/LIBRARIAN=(WRITER=1) DISK$ORACLE[RDB72DB] MFP
```

The other type of parallel backup is initiated using the RMU/PLAN qualifier. NetWorker does support this type of parallel backup. However there is a problem with RMU that causes an ACCVIO. See "Problem With Rdb V7.2 Using A Plan (Oracle Rdb Module)" on page 28

RMU Tracing Feature Not Supported (Oracle Rdb Module)

The NetWorker module for Oracle Rdb does not support the use of the **TRACE** and **LEVEL** switches in an **RMU/LIBRARIAN** command. For example:

```
RMU/LIBRARIAN=(TRACE=filespec, LEVEL=level)
```

To cause the NetWorker software to write debug and trace messages to a specified file, you must define the following NetWorker logical names before beginning the database backup:

- NSR_DEBUG_FILE
- NSR_DEBUG_LEVEL

It is recommended that you deassign these logical names after the backup operation completes. Refer to the *LEGATO NetWorker Administrator's Guide, Release 6.0.1-D, HP OpenVMS Alpha Version* for more information.

RMU/LIBRARY/LIST Does Not Support Wildcards (Oracle Rdb Module)

The RMU program supports a function that queries the librarian catalog. In the case of NetWorker, this function queries the media and file indexes. The format for the RMU list command is:

```
RMU/LIBRARY/LIST <save-set-name>
```

In general, RMU appends the string *.RBF* to any name supplied by the NetWorker Rdb backup template file. Thus, if you use the template file, the resulting save set names are of the form: <BACKUP_NAME><DATE-TIME>.RBF, where <BACKUP_NAME> is the string assigned to the BACKUP_NAME symbol within the backup procedure, and <DATE-TIME> is the date and time of the backup. The **RMU/LIBRARY/LIST** command works correctly only when the fully specified save set name is provided as shown in the following example:

```
$ rmu/library/list corporate_data_2003-10-30_091311.RBF
LIBRARIAN BACKUP FILES
BACKUP NAME: CORPORATE_DATA_2003-10-30_091311.RBF
  CREATION METHOD:      stream
  CREATION DATE/TIME:   Thu Oct 30 09:13:23 2003
  EXPIRATION DATE/TIME: Fri Oct 29 10:14:34 2004
  VOLUME LABEL:        wumpus.tz87.008
  SHARING MODE:        single user
  ORDERING MODE:       sequential access
```

RMU/RECOVER/LIBRARY Fails When Specified Save Set Does Not Exist (Oracle Rdb Module)

RMU generates a bugcheck if you specify a save set name that does not exist.

Problem With Rdb V7.2 Using A Plan (Oracle Rdb Module)

There is a problem with Rdb V7.2 when using a plan file. You will get an ACCVIO when you try to use a plan file. The following shows an example of the ACCVIO:

```
$ rmu/backup/plan reg_backup_db_w3FP.plan
%SYSTEM-F-ACCVIO, access violation, reason mask=04, virtual
address=000000007FF43F8C, PC=0000000000E59521,
PS=00000000
%RMU-F-FATALOSI, Fatal error from the Operating System
Interface.
%RMU-I-BUGCHKDMP, generating bugcheck dump file
DKA0: [ORACLE_REG]RMUBUGCHK.DMP;
%RMU-F-FTL_BCK, Fatal error for BACKUP operation at 23-FEB-2006
17:36:11.12.
```